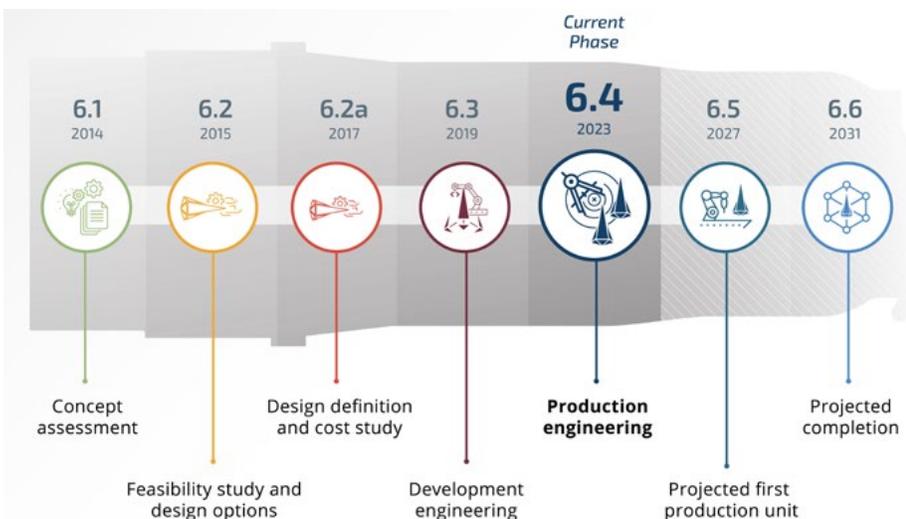




## California & Beyond Edition

# W80-4 Life Extension Program enters production engineering

By **Tim Deshler and Kenny Vigil**



Following NNSA approval earlier this year, the W80-4 Life Extension Program moved into the production engineering phase of the U.S. nuclear weapons life cycle, which will culminate in completion of the program’s first production unit at Pantex in 2027.

Leading up to the production engineering phase, Sandia’s W80-4 team developed requirements and conceptual designs; built test units; down-selected design options; and integrated everything into an overall weapon system, called the baseline

**MOVING FORWARD** — A timeline of the W80-4 Life Extension Program shows how much work Sandians have committed to the weapons system. **Illustration by Stephanie Blackwell and Whitney Lacy**

— CONTINUED ON PAGE 5

# Detecting nuclear materials using light

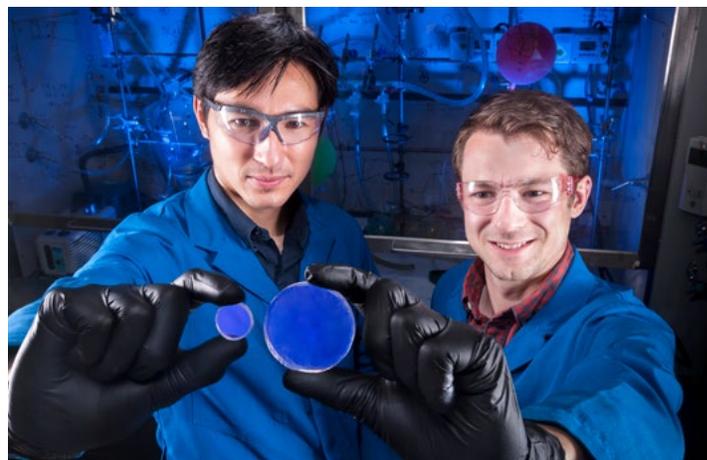
*Sandia partners with former employee to take tech to market*

By **Kim Vallez Quintana**

**B**lueshift Optics, owned by former Sandian Joey Carlson, is working to shift the way radioactive materials are detected, using technology that he helped create while working at Sandia.

Sandia materials scientist Patrick Feng and Carlson collaborated to develop the state of the art technology known as Organic Glass Scintillators for radiation detection. Sandia recently licensed the technology to Blueshift Optics LLC, paving the way for potential commercial production.

“It has the potential to provide us with better data from nuclear



**ADVANCING RADIATION DETECTION** — Sandia researcher Patrick Feng, left, and former Sandian Joey Carlson, hold Organic Glass Scintillators they helped create to detect radioactive materials. **Photo by Randy Wong**

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# Finding unity, purpose in uncertain times



**PURPOSE DRIVEN** — Andy McIlroy is the associate Labs director of the Integrated Security Solutions division. **Photo courtesy Sandia National Laboratories**

By **Michael Ellis Langley**

**T**he world is complex and filled with uncertainty and risk. But at times like this, Andy McIlroy, associate Laboratories director of the Integrated Security Solutions division, finds solace and even inspiration in Sandia's mission and the people called to carry it out.

"Sometimes it's easy to focus on the challenges we have and lose sight of all the positive change that is happening," Andy said.

## Global strife creates uncertainty

The list of dangerous spots around the globe only seems to grow with each passing day, which makes the work underway at every Sandia site all the more impactful.

"It is an incredibly challenging global environment right now, which drives home why we have a nuclear deterrent: The world is indeed a very dangerous place," Andy said.

Andy finds this a sobering reality, but one he is not sure newer Sandians may fully grasp.

“It’s something we haven’t thought about for quite some time,” he said. “Particularly for the two-thirds of the workforce who joined us in the last 10 years, this may be the first time that the reality of how important the deterrent is has come to the fore. That is an awesome responsibility.”

Andy tells his leadership team and new Sandians alike how much our work matters for the nation and therefore how crucial it is for us to deliver on that work — because the nation, as well as large portions of the world we protect, depend upon it.

### Everyone is important

Andy knows all too well how every Sandian contributes to our national security mission.

“Everyone is important to the mission. That’s something we don’t mention enough,” he said. “We need folks to construct our new buildings. We need others to develop our workforce. We need people who keep the books straight. We also need the people who clean our bathrooms and make sure that our living spaces are good for us to be in every day. People ask, ‘Am I really important to the national security mission?’ The answer is absolutely, yes. We wouldn’t have someone here if they weren’t important, and every single person is important.”

Andy believes in acknowledging explicitly the role that everybody plays in delivering on the mission.

“At Sandia, the scientists and engineers who come up with a great idea then partner with other people who can realize a product for use in the field,” Andy said. “This step requires an entirely different set of skills, so the two groups have to be brought together in a team framework. Then we need more people to make the product small or use less power. The end result is a very multidisciplinary team that pulls on all aspects of the Labs.”

### National impact, global reputation

Andy stresses another aspect of Sandia that benefits every national security mission.

“Open science at the Labs means just that — it is open,” he explained. “We publish it openly. We go to conferences; we talk about our work. The work wins awards, and our people are invited to give talks around the globe about what they and their teams have achieved.”

Andy believes that kind of openness and sharing of data is not just good science, it’s good for national defense.

“Each of us should realize that our adversaries are looking at our work and saying, ‘Wow, that’s impressive. If they’re doing that in the open, what in the world are they doing on the core mission?’” he said. “Our public reputation, which is built by our open-science and energy work, plays a huge role in the psychology of deterrence. The credibility of our laboratory rests in part on our open work.”

But Andy said all that science isn’t just for show.

“Not everything we do has a Sandia Thunderbird on it,” he said. “We should be proud of the work we’re doing. It has real impact and shows up regularly as a deciding capability for the nation. We can — and should — take time to reflect on the awesome responsibility we have and the incredible resource we are for the nation.”

### Thinking globally, acting locally

One of Sandia’s newer missions has everything to do with

preserving the world for all humankind.

“There’s another global challenge that’s facing us as well, which is climate change,” Andy said. “This is a truly global, existential issue for us. As a national security laboratory, we need to help the nation rise to meet this challenge.”

In the last few years, the Labs has developed a robust climate security strategy, drawing upon work Sandia was already doing in that space. But one of the first acts of that strategy was setting net-zero carbon goals for the Labs’ own sites.

“I think this is in our DNA,” Andy said. “We need to lead with our own technology. From the very beginning, one pillar of the climate security strategy has been to demonstrate technologies at our sites. We need everybody — from our scientists and engineers to our folks in procurement, facilities and legal. The whole team is required to realize the tremendous scale of change we’re looking for here.”

This includes a large-scale solar installation at the California site with photovoltaic solar cells and a large-scale battery backup system.

“We received a grant from DOE and matching funds from the California Energy Commission for a total of about \$16 million to build a large battery system in Livermore. In addition to serving research purposes, the backup system will be a practical part of our energy source,” he said. “In Albuquerque, we’re looking at a more diverse strategy because it’s a much larger site.”

Sandia is partnering with the U.S. Air Force to implement alternative-energy systems across Kirtland Air Force Base.

“We’re looking at employing not just the photovoltaics, but also our concentrated solar technology and pushing the envelope of what’s possible,” he said. “It’s important that we eat our own cooking, so to speak. I believe we are excellent cooks and that this will be a gourmet meal.”

### Big missions, big stakes

In short, Sandia is taking on the largest, most critical missions on behalf of the nation. Andy is quick to point out how unlikely success on all those fronts would be without the contributions of every Sandian.

“Our team approach gets us from cutting-edge technology to something that can actually be used to improve the security of the nation,” he said. “That’s what we do so well and what many other labs struggle with. They can do the technology and the science. But getting it all the way into the hands of someone who needs it is a real challenge — and we do it time and time again.”

Everyone may not always see the scale of the Labs’ accomplishments, which Andy said is akin to being the inmost doll in a set of nesting dolls.

“Many days, all you see is your own environment. You don’t see the fact that you’re in something bigger,” he said. “The world’s a scary and challenging place right now. At the same time, a lot of good things are happening at the Labs and the division, and sometimes we lose sight of those. We’re building a better and better environment for our folks to work in. We’ve got some super important work to do. We need to go out there and help the nation be safe and secure — and we do so, day after day after day.” 

# Little-known Sandia site center of national, international collaboration

By **Michael Ellis Langley**

**C**athy Branda needed to host a workshop in Washington, D.C., on managing climate-driven zoonotic disease. She needed to ensure 11 different federal agencies and six national labs could all attend and collaborate. She needed to hold the workshop in a place that could accommodate everyone. She needed help.

Fortunately for Cathy — and every other Sandian — there is a small but mighty team waiting for her in the nation’s capital.

“I didn’t even know we had a D.C. office,” Cathy admitted, before adding how grateful she was for everything they did to assist her conference on this vital topic.

## Capital of collaboration

There are many reasons for Sandians to visit the nation’s capital, including visiting lawmakers, collaborating with DOE partners or serving as a detailee to an agency. For Jeanetta Grover, Teresa Miller, Jessica Baxter and Jackie Kirby-Hardy, the office is home.

Sandia’s **office**, next to DOE’s headquarters in the Forrestal Building, is a long-standing hub of activity for the Labs — but it might be the least known of all the Labs’ facilities.

“We do support many of the agencies that are here in Washington, D.C., but we are a touchdown space for all Sandia travelers who come to D.C. for other business,” said Jeanetta, government relations manager and head of the office.

The space is equipped with unclassified offices, a vault-type room, a large classified conference room and a small unclassified conference room.

“With the mix of local agencies that use our space and Sandians, it can get quite busy,” Jeanetta explained.

But it is the people, not the capabilities, who get the most praise.



**SANDIA SERVES** — Sandia’s Washington, D.C., offices are just steps from the DOE headquarters and serve as a home base for those deployed to or visiting the nation’s capital. **Photo by Meagan Brace**

“Jessica Baxter was fantastic,” Cathy said excitedly about the office’s protocol officer. “After I described the kind of workshop we wanted to organize, the first thing she did was to research for me the various facilities that might serve as an appropriate venue — including looking into the costs, what their requirements were. Everything from the number of chairs to catering requirements to audiovisual support — she helped me. She also gave me a tour of the various sites so we could pick the best one.”

Jessica explained how the office is organized to support all Sandians, no matter their need.

“We have reservations on the calendar that were set 18 months in advance and then others that were requested the same day,” she explained. “We do our best to accommodate both those who are able to plan ahead and those who don’t have that luxury. We’re a landing space for people when they need it most.”

Teresa, the office’s deployed security professional, said Sandia’s D.C. office has many features not found in the D.C. offices of other national labs. People can access the secure servers of other agencies, including DOD, and hold classified meetings. That’s why the space is in high demand by

Sandia’s sister labs as well as some DOE personnel.

“I worked for years and years to get that capability, and it’s finally here,” Teresa said. “We do our best to help our colleagues



**CAPITAL CREW** — The four-person staff of Sandia’s Washington, D.C., office — from left, Jeanetta Grover, Jessica Baxter, Teresa Miller and Jackie Kirby-Hardy — not only help traveling Sandians feel right at home, but also facilitate high-level national and international efforts in the nation’s capital. **Photo by Keith Yehle**

at Lawrence Livermore and Los Alamos because their site offices do not have access to classified meeting rooms. We've tried to be very helpful as a resource, and we get a lot of folks running up the street to use our space because there's just not a lot of classified touchdown spaces in this vicinity."

Jeanetta and her team also help expedite many last-minute requests, which they facilitate so that Labs leaders and researchers can seamlessly do what they need to do to serve the nation.

"There might be changes to meeting schedules or something else that creates last-minute changes, but because we know the (Capitol) Hill environment and local agency contacts, we make sure that people are equipped with the right paperwork and meeting space — and that we've made the right accommodations ahead of them."

### Passport to D.C.

The staff doesn't stop at facilitating work and meetings.

"Jessica has created a program called 'Passport to D.C.,'" Cathy said. "She has organized this opportunity for people new or unfamiliar with D.C. to visit the FBI or go to the CIA museum and so on — see things around D.C. that they might not otherwise see and build community. That's really cool."

Jessica said with hundreds of Sandians visiting or stationed there, it just made sense.

"It's in service of enriching the assignee experience with visits to key agencies and institutions across the region," Jessica said. "Places like the Supreme Court and the Pentagon are on the list. We want to orient Sandians in this new environment that they're in."

Jeanetta said it is part of the family atmosphere she and her small team have worked hard to create.

"When travelers come to the office, we like to get to know them better. How was the flight? Who are you meeting with while you're here? How can we help?" she said. "I think the connection for me is getting to hear about the programs and missions that Sandians are working on back in New Mexico. That to me helps the staff feel connected to the Labs. Sandia's mission is just so wide-reaching that you get that breadth from each division and each mission space."

She also sees employees and leadership meet in the D.C. office to reconnect on work items or just simply chat about their day because it is "this little hub that brings people together."

It certainly worked for Cathy. Her workshop included everyone she needed from federal agencies and national labs and was a big success. So much so that she and Jessica are planning the next one right now.

"The workshop led to lots of further engagements for Sandia with various



**HEART OF D.C.** — Sandia's Washington, D.C., office serves high-level Labs, federal agency, congressional and international guests with a suite of resources no other national lab enjoys in the nation's capital. **Photo by Meagan Brace**

interagency partners," Cathy said. "It also enabled us to develop strong connections with people throughout the U.S. government and other national labs interested in this particular topic area. Those relationships are vital to Sandia's continued relevance in this space and growth overall."

Jeanetta, Jessica, Teresa and Jackie are the tip of the needle for Sandia, helping people stationed in the nation's capital, visitors from New Mexico and California, agency partners and even international collaborators. The office may be small, but they work hard to make sure the impact they have on Sandia's mission and people is large.

"Whether we're supporting the Laboratories director or an intern," Jessica said, "we make an impact by being a resource but also adding that personal touch to make Sandians feel at home while they're visiting us here in Washington." 

## W80-4

CONTINUED FROM PAGE 1

design. The flight testing and several other key deliverables demonstrated baseline weapon design performance and enabled the program to advance to the next phase.

As the systems integrator for the W80-4 warhead and design agency for its non-nuclear components, Sandia collaborates closely with other organizations within the Labs and across the U.S. nuclear security enterprise. The W80-4 team partnered with Sandia's Thermal Test Facility to conduct fuel fire safety tests and with Lawrence Livermore National Laboratory to conduct hydrodynamics tests. The team also conducted joint flight tests with the Air Force and Raytheon Missiles & Defense to pair the

W80-4 with its delivery system — the newly developed Long-Range Stand Off cruise missile. The W80-4 is the first modernization program in more than 20 years to refurbish a warhead in parallel with development of a new delivery platform.

"The W80-4 Life Extension Program is currently Sandia's top modernization priority for nuclear deterrence," said Sandia's Deputy Laboratories Director for Nuclear Deterrence and Chief Technology Officer Laura McGill. "The team has successfully executed key design reviews, demonstrating that the weapon system meets performance requirements."

The W80-4 is one of several nuclear deterrence modernization programs originally based out of Sandia's Livermore, California, campus. Following a

realignment of the Labs' modernization programs last year, the W80-4 now spans the Livermore and Albuquerque, New Mexico, campuses. Both management and staff have worked hard to build collaboration across sites, and the results have been positive. Having team members in both locations means the program has a wider breadth of experience, expertise and resources to draw from, and the team is using that to its advantage in developing innovative solutions to some of its most complex challenges.

Mike Hardwick, director of Sandia's California Weapon Modernization Center, leads the Labs' W80-4 Systems team. "I can't overstate how proud I am of every individual and team contributing to the program," Mike said. "Under immense pressure — and with many stakeholders

closely watching — our teams stayed on mission and found novel ways to resolve challenges. Collaborative relationships between the component organizations, science community and systems organizations helped us negotiate compromises and develop effective solutions that none of these teams could have found by themselves.

“I also want to recognize those we often think of in support roles, but who are core to our success, like our project management teams, modeling and simulation,

human resources, procurement, facilities, security and many other organizations,” he said.

With the move to the production engineering phase, the W80-4 program focus has now shifted from design to production. Sandia will soon begin producing some custom electronics for the warhead, including neutron generators, and the team is already partnering closely with the Kansas City National Security Campus to produce several other non-nuclear components that will be integrated with the

warhead. Sandia has also begun partnering closely with the Pantex Plant in Amarillo, Texas, where the full weapon units will be assembled.

“Collaboration — both across Sandia and with our external partners — is vital,” Mike said. “Without everyone’s contributions, the W80-4 program would not succeed.”

Visit Sandia’s [Nuclear Weapons Life Cycle](#) overview to learn more about the Labs’ role in each phase of the nuclear deterrence modernization process. 

## Blueshift

CONTINUED FROM PAGE 1

physics experiments, enhance national security applications both at home and abroad and has applications in fusion energy,” Carlson said.

Patrick specifically noted the applications for border security. “Agencies are trying to cast this wide net to catch nuclear smuggling, and this is one aspect of that effort,” he said. “You could use this technology at a border crossing, in a handheld detector as someone enters a facility, or fly it on a drone to map an area.”

Organic Glass Scintillators emit light in the presence of radiation. It’s different than other technology because it can more efficiently decipher between neutron and gamma ray radiation, allowing for faster identification of potential threats. They are also simpler and less expensive to produce.

“Gammas are everywhere. We are exposed to gamma radiation right now, so if you have a neutron experiment, you need to be able to distinguish them,” Carlson said. “If you have neutrons, you have something special. This applies to national security, nuclear physics and fusion energy.”

The duo says that this creation advances technology that was developed in the 1950s, a technology many believed had reached its peak. “This has been a breakthrough; it remained stagnant for decades in terms of the types of materials used. This is the first time something revolutionary like this has come along,” Carlson said.

Patrick likens the development process to what a cook does when de-crystallizing honey. “We developed a material that behaves like window glass; we call

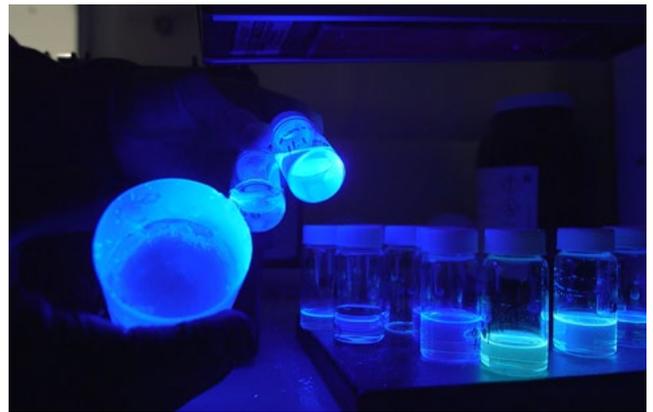
it organic glass. When a quartz crystal is melted and supercooled, it behaves differently. It transmits light equally in all directions and is more resistant to cracking. It’s like when honey is crystallized. It’s still honey but possesses different physical properties because of its molecular structure.”

Carlson says when all these materials work together, you have a new way of detecting radiation.

“Ionizing radiation is challenging to detect, so the scintillator transforms energy into visible light for easier detection. These scintillators are coupled with high sensitivity photo multiplier tubes or detectors which read out the signals.”

The only technology that comes close to this creation is stilbene crystals, which must be grown. They are fragile, cumbersome to produce and limited in size. “You can’t grow them large enough to support their use in many cases,” Patrick said. “That is the key advantage in what we’ve developed. The manufacturing process allows us to mix organic glass with a polymer. You can pour, mold and manufacture on a large scale if needed.”

The big goal now is to commercialize it with the help of Blueshift Optics, based in Oakland, California. Carlson left the Labs through the Entrepreneurial Separation to Transfer Technology program to start the business in 2020. The team sees many potential uses, including by fusion



**A GLOWING REACTION** — An Organic Glass Scintillator, created by a team at Sandia, is used to detect the presence of radiation.

Image by Vince Gasparich

energy companies for high-level experiments. But, as Patrick emphasizes, the most significant application could be safeguarding our country. “It has many different uses to support the same goal: finding radiological material that someone is attempting to subvert or smuggle. This is crucial in supporting Sandia’s mission.”

The team hopes it won’t be long before the technology is deployed at U.S. ports and border crossings and maybe even in the hands of the U.S. armed forces.

Our materials produce a lot more light, double compared what used to be state of the art. There are fewer false positives, and you can detect rarer events with our material. You can detect them faster or from a greater distance. These are things that matter. At a border crossing, it can take 30 minutes to scan one truck. That doesn’t work. We are striving to enhance national and international security and safety; that is the mission. We need practical technology and we make the practical possible,” Patrick said. 

# Labs directors talk NNSA strategy, opportunities and risks



**STRATEGY WELCOME** — NNSA Administrator and DOE Under Secretary for Nuclear Security Jill Hruby welcomes attendees to the Oct. 4 Administrator's Strategy Forum at Lawrence Livermore National Laboratory. More than 1,200 people attended in person and online via livestream.

Photo by Blaise Douros, LLNL



**WORKING TOGETHER** — From left, Sandia Labs Director James Peery, Lawrence Livermore National Lab Director Kim Budil and Los Alamos National Lab Director Thom Mason discuss challenges and opportunities with the nuclear deterrence mission at the Administrator's Strategy Forum on Oct. 4.

Photo by Blaise Douros, LLNL

NNSA Administrator Jill Hruby held another in a series of Administrator's Strategy Forums on Oct. 4 at Lawrence Livermore National Lab in California. The forum brought together Sandia Labs Director James Peery with LLNL Director Kim Budil and Los Alamos National Lab Director Thom Mason to discuss challenges and opportunities at the national labs. More than 1,200 people attended in person and online via livestream and were able to ask questions of the panel following their conversation. <#>

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# Carlsbad site welcomes new leader

By **Sarah Jewel Johnson**

“I wanted to be an archaeologist when I was young. I didn’t get too far into school before I realized that there’s only one Indiana Jones, so I turned to my second love — rocks,” Greg Roselle said about his entry into the field of geology.

While Greg may have missed his opportunity to explore temples in search of archaeological artifacts, he aims to make an impact in his new role as senior manager of Sandia’s Defense Waste Management Programs and Sandia’s Carlsbad, New Mexico, site.

## The road to Carlsbad

Like the adventuresome spirit of Indiana Jones, Greg’s path to Carlsbad spanned the country and a few continents.

“I have a bachelor’s from the University of Arizona in geology and then got both my master’s and Ph.D. from the University of Wisconsin. After I graduated, I did a postdoc at the University of Bern in Switzerland for three years and then ended up at the University of Utah as a research professor,” Greg said.

Then, one day out of the blue, the Total System Performance Assessment Group



**RESTORING THE PAST** — In his free time, Greg Roselle restores prewar cars, including his 1920s-era Model T Ford. **Photo by Greg Roselle**



**FAMILY VALUES** — Senior Manager of Defense Waste Management Programs Greg Roselle, center, is a father of four and a grandfather of two. **Photo courtesy of Greg Roselle**

at Yucca Mountain contacted Greg for an interview.

“I still don’t know how they got hold of my resume,” Greg said.

Greg’s work at Yucca Mountain was his first encounter with Sandia. During his time on the project, he worked closely with many Sandians. Three years later, he joined Sandia and became the lead geochemist at Sandia’s Carlsbad location.

“I was in Carlsbad for seven years. Eventually I moved to southeast Idaho to be a professor at Brigham Young University-Idaho in the geology department, and then I’ve spent the last five years as the department chair,” Greg said. “I saw an article on Facebook about Paul Shoemaker retiring, so I looked at the Sandia website and applied. Three weeks later, I had the job.”

## The Carlsbad legacy lives on

Back in Carlsbad for a second time, Greg is ready to continue Sandia’s decades-long legacy as the scientific adviser for the [Waste Isolation Pilot Plant](#).

Greg and his team will support WIPP’s long-term performance 10,000 years into the future using a suite of computer codes and analysis. Since WIPP is the world’s only licensed and operating deep geologic repository for transuranic nuclear waste disposal, the importance of the task is top of mind for Greg.

“WIPP is a fantastic project that is of national importance,” Greg said.

Sandia supports WIPP activities that include modifications to the repository’s operating permits, periodic recertifications of the repository and ongoing monitoring of the repository performance against regulatory requirements.

“When WIPP opened, it was the first facility of its kind. We’re piloting putting waste in, and eventually, we’ll pilot sealing it up,” Greg said.

Building on a 50-year history with WIPP, Sandia is now engaged in shaping technical solutions to national nuclear waste management challenges that go well beyond the disposal of transuranic waste.

“We have so much to show and teach the world in terms of nuclear waste disposal, and we’re showing it can be done safely,” Greg said.

While WIPP’s current scope handles only transuranic waste derived from defense-related activities, Sandia’s Nuclear Waste Management team is contributing to a future in which nuclear waste is better understood, which is imperative to the nation’s clean-energy future.

“Even though WIPP is not a spent-fuel program, it shows that we can deal with these types of elements. We can be an example and hopefully positively affect the entire nuclear waste management cycle,” Greg said.

He’s also excited to continue Sandia’s work in the Defense Waste Management



**LOVE OF THE ALPS** — A photo of the Matterhorn taken by Greg in Zermatt, Switzerland, during his many travels to the area.

Photo by Greg Roselle

program, which performs environmental restoration corrective actions, operates remediation systems and monitors contaminant levels in soil and groundwater.

“I think our goal is to do our best work and to be honest and open scientific advisers,” Greg said. “We’ve got an opportunity to continue the great work and see what we might be able to expand.”

### Leadership foundations and family values

In his first few months on the job, Greg has two main goals: support DOE’s needs and establish leadership rapport with his new team.

“Honesty, respect and trust are what make me operate. That’s how I would describe my leadership philosophy,” Greg said.

He takes his management inspiration from leaders he’s encountered in the past. These leaders allowed him to have the freedom to work in his own way and have supported him when needed.

“The dean I worked for was amazing. As his employee, I always knew he had my back. He was honest and open in his communication style, and he had respect for everyone in his college — from department chairs to admins to faculty. He always gave the same level of respect to everyone,” Greg said.

Greg hopes to bring that same sense of equality and support to his new role.

“As a leader, you’ve got to be honest with people. You’ve got to respect them for the skills they bring and trust them to do what they need to do. They all have a purpose that they bring to the

workplace, and it’s my job to support that work. You’ve got to care about them and care about what’s happening outside of work. It’s almost like being a parent,” Greg said.

And as a father of four and grandfather of two, Greg knows a thing or two about parenting.

While his recent move back to Carlsbad took him and his wife farther away from their grandkids in Idaho, they are excited to be back in a close-knit community.

“We’ve still got good friends down here from the last time, and we’ll be going back to Idaho to visit,” Greg said.

Between his new work role and planning trips to see his grandkids, Greg restores prewar cars, including a 1920s-era Model T Ford. He enjoys traveling with his family and finds that 30-plus years after his postdoc, Switzerland still holds a special place in his heart.

“I have a deep love for Switzerland. I did my postdoc there, and my son was born there. I was there four years ago for a sabbatical and spent four months there. I could live in the Lauterbrunnen Valley — specifically the village of Mürren. It sits up on a hillside at the top of a valley and looks over the mountains. The Alps are hard to explain if you haven’t seen them — even to geologists. There is just nothing that matches their scale,” Greg said.

For now, Greg is happy to begin a new chapter in a familiar place.

“It’s funny. When I took the job 17 years ago, I told my wife, ‘I think this is the job I could retire at.’ But I really think this could be my last move — I just took a 10-year detour to come back. I’m happy to be here.” 

**Frozen**  
**TAKE A TURKEY TO WORK**  
*on the Credit Union!*

**TUESDAY 11/14**

**HELP US HELP THE COMMUNITY THIS SEASON**

You can donate a frozen turkey or contribute money to help feed people this holiday season in the communities of Albuquerque, Rio Rancho, Edgewood, Los Lunas and new this year, Livermore, CA.

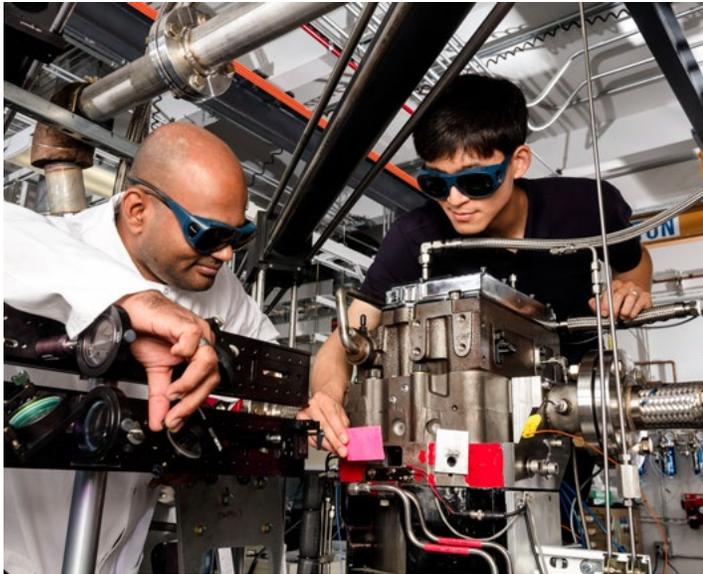
For all collection locations and financial contribution information, visit Community Involvement at [turkey.sandia.gov](https://turkey.sandia.gov).

QUESTIONS TO KATRINA WAGNER

# Tour of California

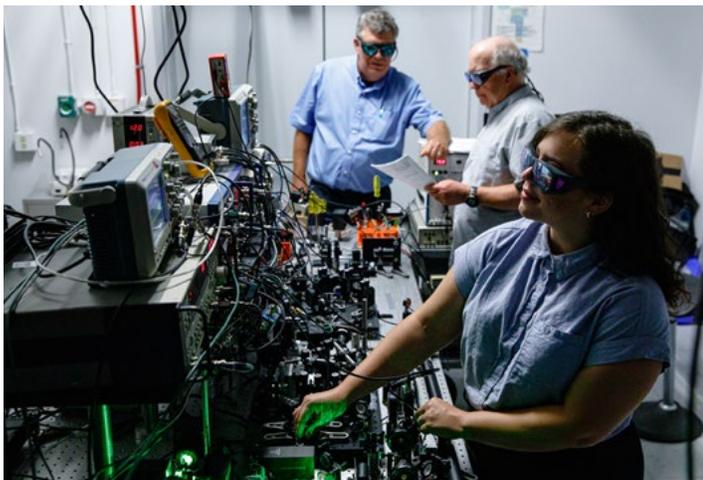
The California site has changed much in just the last few years, adding capabilities and amenities that allow the Integrated Security Solutions division to perform a greater quantity of work at a higher level and ensure Sandians in Livermore have a better quality of life while on campus.

The photos on these pages represent a few of the upgrades and changes now present at Sandia California.



**HEAVY DUTY** — Rajavasanth Rajasegar, left, and Taesong Lee align a laser light sheet to conduct simultaneous flow-field and fuel-mixing visualization in a direct-injected hydrogen-fueled heavy-duty engine. The Heavy-Duty Optical Engine Laboratory boasts optical and laser-based diagnostic techniques to understand the processes governing efficiency and emissions formation in gaseous and liquid fueled engines for heavy-duty on-road and off-road applications.

**Photo by Randy Wong**

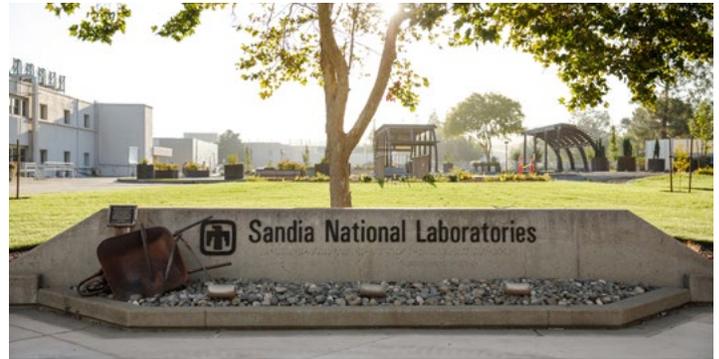


**SEEING THE LIGHT** — From left, Scott Bisson, Joe Bartolick and Savannah Cuozzo are shown in the Quantum Sensing and Imaging Lab, working with a squeezed-light source instrument that is being developed for quantum sensing. The team has the capability to manipulate the quantum noise statistics of light to improve upon classical capabilities for imaging or spectroscopy.

**Photo by Spencer Toy**



**TESTING EVERYTHING** — From left, Mike Jew, Anthony Li and Arick Jones perform shock and vibration qualification testing of the last development build of a weapon component developed at Sandia. **Photo by Spencer Toy**



**HISTORY** — A plaque for the carefully placed wheelbarrow at Sandia California's central plaza reads, "This antique wheelbarrow once worked the land on the south side of East Avenue that is part of what is now Sandia CA. That property was acquired in 1942 by the U.S. Government from Mr. Louis Madsen, Mr. and Mrs. John and Dora Bargman, and Mr. and Mrs. Charles and Sue Nissen. We are proud to display it here to remind us of the diversity that has taken place in the Livermore Valley." **Photo by Spencer Toy**



**HOUSE PROUD** — Sandia California has redesigned and refurbished the landscaping of the Livermore site as part of the Labs' commitment to care for the facilities the American people have granted us while also creating less need for water and other resources. **Photo by Spencer Toy**



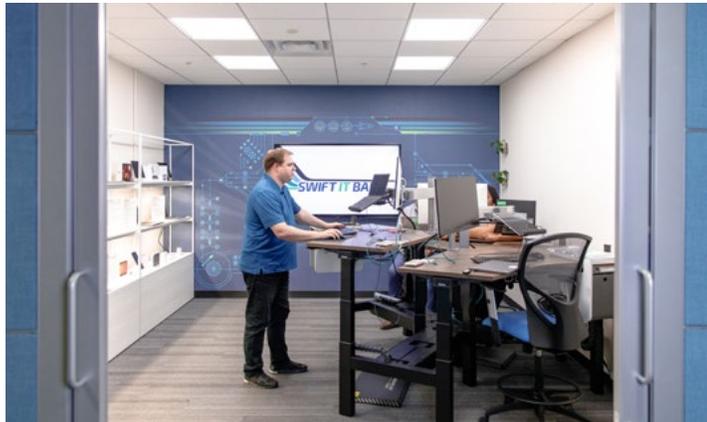
**NATIONAL SECURITY** — From left, Brett Sternecker, Irene Bohannon and Dan Fonte tour a new W80-4 model and Mk21-Fuze exhibit, an interactive experience to learn about the Livermore Valley systems and components.

**Photo by Spencer Toy**



**HEALTHY LIFE** — Meghan Rogers, left, meets with registered dietitian Gina Madison to discuss her health goals. Health coaching is just one of the services available at the refurbished Life Design Center on the Livermore campus.

**Photo by Spencer Toy**



**TECH CENTRAL** — Sandia’s new California SWIFT IT Bar provides information technology services. Walk-in unclassified support services include computer troubleshooting, YubiKey help, mobility services and new device setup.

**Photo by Spencer Toy**

# VETERANS DAY CALIFORNIA CELEBRATION




Guest Speaker  
**LIEUTENANT COLONEL MARISOLA A. CHALAS**  
Garrison Commander, Parks Reserve Forces Training Area

## THURSDAY, NOV. 9

904/AUD | 1-2 p.m. (PST)

The 2023 Veterans Day event will be hosted by Andy McLroy and the California Military Support Committee. Color Guard to be performed by Berkeley ROTC

Visit [wp.sandia.gov/msc](http://wp.sandia.gov/msc) for more information.

Sponsored by the  **Military Support Committee CALIFORNIA**



Receive 1000 VP points for attending in person

# VETERANS DAY NEW MEXICO CELEBRATION




Guest Speaker  
**BRIGADIER GENERAL MICHELE K. LAMONTAGNE**  
New Mexico Air National Guard Assistant Adjutant General

## THURSDAY, NOV. 9

STEVE SCHIFF AUDITORIUM | 1-2 p.m.

**US Marine Corps will have a donation box for Toys for Tots**

The 2023 Veterans Day event will be hosted by Brian Carter and the NM Military Support Committee.

Visit [wp.sandia.gov/msc](http://wp.sandia.gov/msc) for more information.  
Co-Sponsors Asian Leadership and Outreach Committee (ALOC) and Sandia Pride Alliance Network (SPAN)

Sponsored by the  **Military Support Committee NEW MEXICO**



Receive 500 VP points for attending in person

# Sandia marks 20-year partnership with Department of Homeland Security

*Mark Allen and Dan Sanchez reflect on building the collaboration*

By **Lea Blevins**

**D**an Sanchez had dropped off his wife at work in Washington, D.C., and was en route to his son's daycare center when he saw a huge plume of smoke rise. It was Sept. 11, 2001, and an airplane had flown into the Pentagon.

"When all of this happened, it was very real for me," said Sanchez, who was working for the NNSA, which oversees Sandia. Thinking back upon that day, he recalled, "It was the memories of having to abandon and get out of your car and walk over the long bridge, put your kid over your shoulder and hike across the Potomac — and you don't really know what's happening."

In response to the Sept. 11 terrorist attacks, the Department of Homeland Security was created and began operations in 2003, marking 2023 as the 20th anniversary. Sandia has been involved with the homeland security mission from the department's inception, and NNSA and Sandia have developed a strong relationship with DHS over the years.

Sanchez now serves on the senior leadership team with the NNSA Sandia Field Office, which has responsibility for the management and oversight of Sandia, serving as an adviser for national security programs across the Labs.

His personal experience with the attack on the United States made him even more invested in helping build NNSA's and Sandia's enduring strategic partnership with DHS, which was created two decades ago through the combination of all or part of 22 federal departments and agencies into a unified, integrated department.

## A blossoming partnership

Sanchez has worked in close partnership with Sandia, and in particular with Mark Allen, Sandia's senior administrator

for the Integrated Security Solutions division, including the Energy and Homeland Security portfolio.

"We were no longer just a nuclear and multiprogram laboratory — we had transitioned to a national security laboratory, first and foremost that has a unique nuclear weapons responsibility," Mark said.

Mark joined Sandia in 2004 as a project manager working on the Labs' support of DHS under the directorial leadership of Jill Hruby, who now serves as Under Secretary for Nuclear Security and Administrator of NNSA.

Mark helped establish how Sandia would handle program development and project management in carrying out work for DHS. He also guided and nurtured the use of a master interagency agreement between the government agencies that provided streamlined contracting, enabling the Labs' rapid technical response to a DHS request.

"I was really honored," he said. "Under her oversight, we were able to build the things that we are doing today for DHS."

As a federally funded research and development center, Sandia partners directly with DOE, NNSA and DHS with a common commitment to prevent future attacks against the nation. Sandia is one of the national laboratories that helped build the framework and continues to support the 22 DHS components that now include agencies such as the Transportation Security Administration and the Federal Emergency Management Agency. This framework that established an interagency agreement between DOE and DHS allows Sandia to quickly respond to DHS mission needs.

## A shared interest

"We're viewed as a trusted partner. As an FFRDC, we have a unique relationship with the government in providing an unbiased scientific and systems engineering approach that is different from that of private industry," Mark said. "We're working for — as our motto says — exceptional service



**COMMITTED TO COLLABORATION** — Dan Sanchez serves on the senior leadership team of the NNSA Sandia Field Office.

Photo courtesy of Dan Sanchez

in the national interest, and we apply that to what DHS needs. They come to us with what they think is an existing threat, an evolving threat or just a tough nut that needs to be cracked, and we have a systems engineering laboratory with capabilities across all of Sandia's centers that can bring solutions to the forefront."

Sandia briefs DHS annually on **Laboratory Directed Research and Development** work and gathers input on programs to push the frontiers of science and engineering. This allows Sandia to further its service to the nation by helping meet the needs of homeland security.

"There's a huge value DHS receives from being able to access the resources within DOE to solve the most pressing needs of the nation," Mark said.

From developing open-architecture design for airport screening systems to working on countering chemical and biological threats, Sandia has contributed to the homeland security mission in a variety



**DEDICATED CAREER** — Mark Allen, a Sandia senior administrator for the Integrated Security Solutions division, including the Energy and Homeland Security portfolio, joined the Labs in 2004 as a project manager supporting the Department of Homeland Security.

Photo courtesy of Mark Allen

of ways. Sandia has also supported national emergencies such as hurricane response efforts and developed technology that has kept watch over large events such as the Super Bowl.

“Sandia provides this stream of research and development into a systems engineering model and pushes out something that is helpful and useful to protect the nation,” Mark said.

### A world view

In the 20 years since the founding of DHS, Sandia’s support has allowed the agency to aid the nation on worldwide matters, while always striving for continuous improvement.

“There have been several other world events since 9/11, but the most recent one that hits home and is still kind of raw for all of us is the global health pandemic and the shutdown of our nation,” Sanchez said, adding that the interagency agreements already in place allowed Sandia to step up when needed. “Our multiprogram national security laboratories were in a much better position to be able to work with our sister labs and agencies like DHS to deploy technologies at the speed of mission need.”

The 20-year partnership of the DOE laboratories and DHS has overcome impediments and obstacles in order to serve

the nation. The interagency collaborations are driven by threat-informed and mission-inspired national security needs, enabled by a strong science, technology and engineering capability base from across the Labs.

“We share a common commitment to prevent future attacks across the nation because we have to be in a position to respond to natural, accidental and intentional disasters that could be either disruptive to our way of life or truly bring harm to our American prosperity or to our economic security,” Sanchez said.

“We’ve come a long way since 9/11, with many lessons encountered and overcome. The strategic partnership that NNSA has established with DHS has enabled Sandia to unleash capabilities that have only further strengthened our homeland security. This has been a highlight of my career, supporting strategic partnerships to enable Sandia to deliver the exceptional service to our nation that is done so well. Our relationship with DHS is special because their mission success is our mission success.” 

# Sandia, Quest Science Center unified for community good

By **Michael Shaikh**

**S**andia’s partnership with Livermore’s Quest Science Center is a top priority for the Labs’ California Community Involvement team.

Quest’s vision is to inspire and nurture everyday exploration for lifelong engagement with science and technology, through STEM activities that are designed to raise curiosity and imagination in young students and to expose older learners to the vast relevance of science and technology in everyday life.

Sandia’s relationship with **Quest Science Center** demonstrates how corporate partnerships with community-based organizations increase the success of education outreach programs, resulting in better academic outcomes and career pathway achievements for students of all ages.

## Deep ties to Sandia

Quest Science Center was founded and is directed by retirees from Sandia and Lawrence Livermore national laboratories, along with other science and technology professionals, educators and community leaders. These visionaries wanted to pay it forward by donating their time and expertise to facilitate the learning of local students.

The center’s learning activities are conceptualized, designed and facilitated by a team of high school interns who work closely with the Quest team and skilled educators.

“Corporate partners like Sandia add in opportunities for engagement with current industry professionals, postdocs and college interns,” said Michelle Walker-Wade, community relations specialist for Sandia’s California site. “Working together, we can



**TRAVELING SOUND WAVES** — Community Involvement intern Michael Shaikh demonstrates how sound waves travel at Quest Science Center’s Sound Sensations event on July 8.

Photo by Michelle Walker-Wade



**KIDS DAY** — Quest Science Center Director Rick Stulen, left, a Sandia retiree who served as vice president of the California site, shows a student how circuit boards function at Sandia's Kids Day in Livermore on April 22.

Photo by Spencer Toy

connect everyone to science and technology in keeping with the science center's vision."

## Activities all year long

The Community Involvement team at Sandia's Livermore campus has helped plan learning activities, connected Quest with industry professionals and assisted with several free science events open to the public. Sandia has also supported the center financially through sponsorships.

Throughout the year, Donny Robinson, a materials scientist at the Labs, fostered the relationship between Sandia postdocs and Quest by helping high school interns take their conceptualized activities through the engineering process.

Sandia also partnered with Quest on the following activities in 2023:

- **Tri-Valley Innovation Fair.** Several Sandians, including Paolo Arguelles, Helena Jin and Austin Scheck shared hands-on activities with students at the fifth annual Tri-Valley Innovation Fair in April. For example, an Ozobots activity introduced kids to coding logic.
- **Kids Day at Sandia.** Quest Science Center Director Rick Stulen was a guest presenter at Sandia's Kids Day in Livermore this past April. A former vice president of Sandia's California Laboratory before retiring from the Labs, Stulen brought several hands-on STEM activities for middle and high school attendees to explore.

- **Sound Sensations.** Community Involvement intern Michael Shaikh collaborated with Quest in July to develop an activity that helps youth explore the intricacy of sound.
- **Weather Wonders.** Kids investigated weather and climate phenomena during a wind energy activity in August. Sandians Jessica Williams and Austin Scheck recruited family members to help make this Quest activity a success.
- **Livermore Youth Climate Summit.** The Labs played an integral part in the summit in September. Hydrogen researcher Kristin Hertz rallied a team of Sandia experts in clean-energy transportation research to demonstrate and discuss Hyundai's hydrogen fuel cell vehicle with high schoolers and community members. Howard Royer, who leads Sandia California's net-zero effort, helped students learn about climate resilience efforts by showcasing the site's net-zero plan.
- **Tracy Connects.** Sandia collaborated with Quest and the Tracy Unified School District to host several STEM adventure activities at Tracy Connects, a community day in September sponsored by the Tracy Chamber of Commerce.
- **Engineering Encounters.** In October, Sandia hosted a hands-on activity building small catapults out of dowels and rubber bands.

## Foundation for the future

When asked about Sandia's connection with Quest, Michelle said, "In addition to being important to Sandia's current and retired leadership, I believe each Sandia volunteer plays a crucial role in educating youth on various STEM topics.

"Our consistency in bringing fun, innovative and engaging interactive activities and demonstrations will ensure that youth continue to grow in their knowledge and exploration of STEM fields and future career opportunities, especially at the national laboratories." 



**SPREADING STEM** — Sandia volunteers, from left, Julia Robinson, Michelle Walker-Wade, Virginia Meagher and Robert Meagher collaborated with Quest Science Center and the Tracy Unified School District to host STEM adventure activities for youth and parents at Tracy Connects on Sept. 9.

Photo by Dean Reece



**NET ZERO** — Howard Royer, left, the leader of Sandia California's net-zero effort, showcases the site's net-zero plan with Sandians Michael Shaikh and Kylie Johnson to help Livermore Youth Climate Summit attendees learn about climate resilience efforts.

Photo courtesy Quest Science Center



**LEARNING TO CODE** — Sandians, from right, Paolo Arguelles and Austin Scheck engage kids with an Ozobots coding-logic activity at the fifth annual Tri-Valley Innovation Fair on April 15.

Photo by Helena Jin